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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/550,256	09/22/2005	Donald Edwin Hargraves	2974/2US	1625
23638 7590 03/17/2009 ADAMS INTELLECTUAL PROPERTY LAW, P.A. Suite 2350 Charlotte Plaza 201 South College Street CHARLOTTE, NC 28244				
			EXAMINER KIM, JOHN K	
			ART UNIT 2834	PAPER NUMBER
			MAIL DATE 03/17/2009	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/550,256

Applicant(s)

HARGRAVES ET AL.

Examiner

JOHN K. KIM

Art Unit

2834

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 February 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-5,7,13-17,19 and 20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3-5,7,13-17,19 and 20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 September 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

RCE

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 2/3/2009 has been entered.

Response to Amendment

2. The claims 1 and 13 have been amended. Claims 2, 6, 8-12 and 18 have been cancelled. Claim 20 has been added.
3. In view of amendment, the examiner reviewed amended claims and remarks as follows.
4. For claim 7, Noguchi et al (US 5639168) discloses that bearings are constructed from high carbon chromium steel (Col. 8, line 55-57), Johnatakis et al (US 5134328) and Nishimura (US 6495941) disclose housing assembly and rotor assembly are constructed from stainless steel, respectively, and Kan et al (US 6528909) suggests use of 400 series stainless steel in the motor assembly. (col. 7, line 40-55)

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
 2. Ascertaining the differences between the prior art and the claims at issue.
 3. Resolving the level of ordinary skill in the pertinent art.
 4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
6. Claim 1, 5, 7, 13, 14, 17 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fries (US 5237228) in view of Brown (US 2001/0030476).

As for claim 1, Fries shows (in Fig. 1) and discloses an electrical machine, comprising: a housing assembly (4) having first (5) and second ends (14); a first bearing (8) mounted in said housing, said first bearing (8) having a plurality of rolling elements disposed between first inner and outer races ; a second bearing (15) mounted in said housing and spaced away from said first bearing (8), said second bearing (15) having a plurality of rolling elements disposed between second inner and outer races; a rotor

assembly (2) including a shaft (1) having first and second ends mounted in said first and second bearings (8, 15), respectively, such that said shaft has a predetermined amount of axial and radial play relative to said housing (col. 2, line 3-10, as bearing out ring is moving and shaft is mounted to bearing); a biasing element (10) disposed between one of said shaft (1) or said housing and one of said bearings (8), said biasing element (10) for initially urging said shaft to a preloaded position relative to said housing (intended use), wherein said first inner race and said second inner race (those of 8 and 15) are locked into respective fixed positions to said shaft (1) (col. 2, line 3-10) and said first outer race and said second outer race (those of 8 and 15) are locked into respective fixed positions to said housing (5) to prevent axial and radial movement of each of said first inner race and said second inner race relative to said shaft (1) and said first outer race and said second outer race (those of 8 and 15) relative to said housing (4), such that said shaft (1) is locked in said preloaded position to prevent reciprocating axial and radial movement during machine operation (intended use of the biasing element).

Fires however is silent to show or disclose the coefficients of thermal expansion of said housing assembly, said rolling elements, races, bearings, and said shaft are selected so that said rolling elements, races, bearings, and said shaft are maintained in said locked preloaded position due to the selected coefficients of thermal expansion during varying thermal conditions during machine operation.

In the same field of endeavor, Brown shows (in Fig. 1) and discloses [0030] a shaft is supported for rotation within the stator on ceramic bearing assemblies, and the bearing assemblies have the same coefficient of thermal expansion as the rotatable shaft,

stator, housing, and other structural parts. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to combine the teaching of Brown with that of Fries to have the coefficients of thermal expansion of said housing assembly, said rolling elements, races, bearings, and said shaft are selected so that said rolling elements, races, bearings, and said shaft are maintained in said locked preloaded position due to the selected coefficients of thermal expansion during varying thermal conditions during machine operation to provide a more rigid, precise, non-electrically conductive, matched expansion bearing assembly. [0016]

As for claim 5, Fries in view of Brown shows and discloses the claimed invention as applied to claim 1 above. Fries further shows (in Fig. 1) and discloses said housing assembly (4) comprises: a generally cylindrical housing including an axially extending portion (4) with a front end plate (5) connected to a front end thereof; and an end bell (14) attached to a rear end of said housing.

As for claim 7, Fries in view of Brown shows and discloses the claimed invention as applied to claim 1 above. Fries in view of Brown discloses the claimed invention except for said bearings are constructed from high carbon chromium steel and said housing assembly and said rotor assembly are constructed from 400 series stainless steel. It would have been obvious to one having ordinary skill in the art at the time the invention was made to use bearings made from high carbon chromium steel, housing assembly and rotor assembly made from 400 series stainless steel, since it has been held to be within the general skill of a worker in the art to select a known material on the

basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416. See remarks above.

As for claim 13, Fries shows (in Fig. 1) and discloses an electric motor, comprising: a generally cylindrical housing assembly (4) having first (5) and second ends (14), said housing defining first and second spaced-apart bearing pockets (12 and at 14); a first bearing (8) having a plurality of rolling elements disposed between first inner and outer races, said first outer race being received in said first bearing pocket (12); a second bearing (15) having a plurality of rolling elements disposed between second inner and outer races, said second outer race being received in said second bearing pocket (at 14); a rotor assembly (2) including a shaft (1) received in said first and second inner races (col. 2, line 3-10), such that said rotor (2) has a predetermined amount of axial and radial play relative to said housing (col. 2, line 3-10); a biasing element (10) disposed between one of said shaft (1) or said housing and one of said bearings (8) which initially urges said shaft (1) to a preloaded position relative to said housing (4), wherein said first inner race and said second inner race (those of 8 and 15) are locked into respective fixed positions to said shaft (1), and said first outer race and said second outer race (those of 8 and 15) are locked into respective fixed positions to said housing (4) to prevent axial and radial movement of each of said first inner race and said second inner race (those of 8 and 15) relative to the shaft and said first outer race and said second outer race (those of 8 and 15) relative to the housing (4), such that said rolling elements, races, bearings and said shaft are locked in said preloaded

position to prevent reciprocating axial and radial movement during machine operation (intended use of the biasing element).

Fries however is silent to show or disclose the coefficients of thermal expansion of said housing assembly, said rolling elements, races, bearings, and said shaft are selected so that said rolling elements, races, bearings, and said shaft are maintained in said locked preloaded position due to the selected coefficients of thermal expansion during varying thermal conditions during machine operation.

In the same field of endeavor, Brown shows (in Fig. 1) and discloses [0030] a shaft is supported for rotation within the stator on ceramic bearing assemblies, and the bearing assemblies have the same coefficient of thermal expansion as the rotatable shaft, stator, housing, and other structural parts. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to combine the teaching of Brown with that of Fries to have the coefficients of thermal expansion of said housing assembly, said rolling elements, races, bearings, and said shaft are selected so that said rolling elements, races, bearings, and said shaft are maintained in said locked preloaded position due to the selected coefficients of thermal expansion during varying thermal conditions during machine operation to provide a more rigid, precise, non-electrically conductive, matched expansion bearing assembly. [0016]

As for claim 14, Fries in view of Brown shows and discloses the claimed invention as applied to claim 13 above. Fries further shows (in Fig. 1) and discloses said

first and second outer races are secured to said housing (12, 14), and said first and second inner races are secured to said shaft (1).

As for claim 17, except claim dependency, the claim contains the substantially same limitation as claim 5 and is rejected for the same reason set forth in connection with the rejection of claim 5 above.

As for claim 19, except claim dependency, the claim contains the substantially same limitation as claim 7 and is rejected for the same reason set forth in connection with the rejection of claim 7 above.

7. Claims 3 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fries (US 5237228) in view of Brown (US 2001/0030476) and in further view of Otsuka (US 6023113).

As for claim 3, Fries in view of Brown shows and discloses the claimed invention as applied to claim 1 above. Fries in view of Brown, however, is silent to show or disclose the biasing element comprises a spring disposed between rotor assembly and said first or second inner race. In the same field of endeavor, Otsuka shows (in Fig. 1) and discloses a biasing element comprises a spring (7) disposed between rotor assembly (6) and first or second inner race (of 3). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to combine the teaching of Otsuka with that of Fries in view of Brown since it has been held that rearranging parts of an invention involved only routine skill in the art. *In re Japikse*, 86 USPQ 70 (CCPA 1950)

As for claim 15, except claim dependency, the claim contains the substantially same limitation as claim 3 and is rejected for the same reason set forth in connection with the rejection of claim 3 above.

11. Claims 4 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fries (US 5237228) in view of Brown (US 2001/0030476) and in further view of Sato (US 5497040).

As for claim 4, Fries in view of Brown shows and discloses the claimed invention as applied to claim 1 above. Fries in view of Brown, however, is silent to show or disclose said biasing element comprises a spring disposed between said housing and said first or second outer race. In the same field of endeavor, Sato teaches (in Fig. 1) biasing element comprises a spring (15) disposed between housing (2) and said first or second outer race (of 6). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to combine the teaching of Sato with that of Fries in view of Brown since it has been held that rearranging parts of an invention involved only routine skill in the art. *In re Japikse*, 86 USPQ 70 (CCPA 1950)

As for claim 16, except claim dependency, the claim contains the substantially same limitation as claim 4 and is rejected for the same reason set forth in connection with the rejection of claim 4 above.

8. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fries (US 5237228) in view of Brown (US 2001/0030476) and in further view of Naman (US 6822354).

As for claim 20, Fries in view of Brown shows and discloses the claimed invention as applied to claim 1 above. Fries in view of Brown, however, is silent to show or disclose the coefficients of thermal expansion of said housing assembly, said balls, races, bearings, and said shaft are selected so that said rotor assembly will be retained in said preloaded position over a temperature range of about -40 degree C to about 105 degree C.

In the same field of endeavor, Naman teaches motor temperature of operation between 110 degree C and - 40 degree (col. 4, line 48-67) which is close enough to the range in the invention. Furthermore, it is well known for those skilled in the art that many of commercial motors are designed under class A insulation by NEMA and UL standard and the maximum temperature of A class insulation is 105 degree C (see NEMA/UL Table in previous office action mailed on 11/14/2008), and for magnet, especially for ferrite family magnet, the lower allowable temperature is -40 degree C or higher depending on the thickness of the magnet, and it is due to demagnetization region. If such magnet is exposed below that temperature, the magnet is losing the power permanently. Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to combine the teaching of Naman with that of Fries to set within safe operation range, since it has been held that where the general

conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

Response to Arguments

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. As a result, applicant's arguments have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JOHN K. KIM whose telephone number is (571)270-5072. The fax phone number for the examiner where this application or proceeding is assigned is 571-270-6072. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Quyen Leung can be reached on 571-272-8188. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

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USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Quyen Leung/
Supervisory Patent Examiner, Art Unit 2834

JK